Polyswitch Thermal Protection

041

J.-M. Brassart

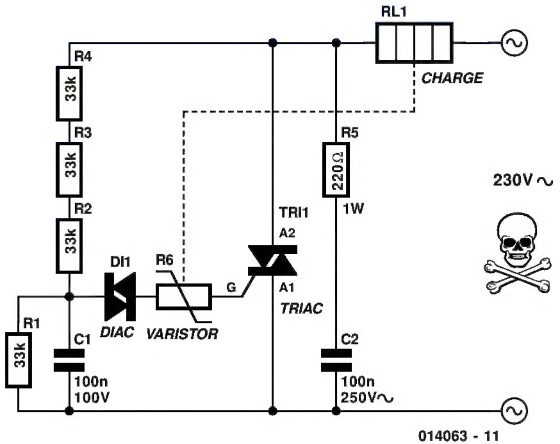
A Polyswitch is an electronic fuse, which interrupts a protected circuit when the nominal current has been exceeded, but returns to its original state once it has cooled down.

In reality, the Polyswitch performs the same function as a fuse, namely interrupting the current when this has reached an excessive level. The classical fuse simply gives up the ghost — it is either ‘ok’ or ‘blown’. There is no other solution then to replace it, once the electrical problem has been resolved. The Polyswitch however, may be returned to its serviceable state by switching off the power supply. It is no longer necessary to replace the fuse.

As yet, the most conventional areas of application for a Polyswitch are loudspeakers, batteries, motors, power supplies, chargers and other equipment with a coil.

Investigating the operation of the Polyswitch a little closer, it can be seen that the resistance (which is of the order of a few ohms at room temperature) rapidly increases above about 110 °C.

It may be assumed that everyone knows that the heating element of an electric kettle or coffee maker will quickly burn out if it is allowed to boil dry. Putting one and two together, the author had the idea to use a circuit with a Polyswitch, as is shown here, for the previously mentioned household appliances that are not protected or, potentially, as a replacement of the original protection.



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The Polyswitch depicted here is in thermal contact with the heating element. Together with the triac, which drives the load, it acts like a kind of thermostat that limits the temperature to about 120 °C. The size of the Polyswitch is not important, but because of its small dimensions an RXE 010 was selected.

The Polyswitch from Raychem used here has the following characteristics:

Holding current:	0.1 A
Trip current:	0.2 A
Initial resistance:	4.5 Ω

Visiting the Internet sites www.raychem.com and www.bourns.com respectively is highly recommended. You have a good chance of finding these parts in the catalogues of the well-known mail order supply houses. (014063-1)